

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
5 February 2004 (05.02.2004)

PCT

(10) International Publication Number
WO 2004/012320 A3

(51) International Patent Classification⁷: **H02J 9/06**

(21) International Application Number:
PCT/GB2003/000839

(22) International Filing Date: 28 February 2003 (28.02.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0217767.3 31 July 2002 (31.07.2002) GB

(71) Applicant (for all designated States except US): **XP PLC**
[GB/GB]; 16 Horseshoe Park, Pangbourne, Berkshire RG8
7JW (GB).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **KING, Steve**
[GB/GB]; c/o XP Plc, 16 Horseshoe Park, Pangbourne,
Berkshire RG8 7JW (GB).

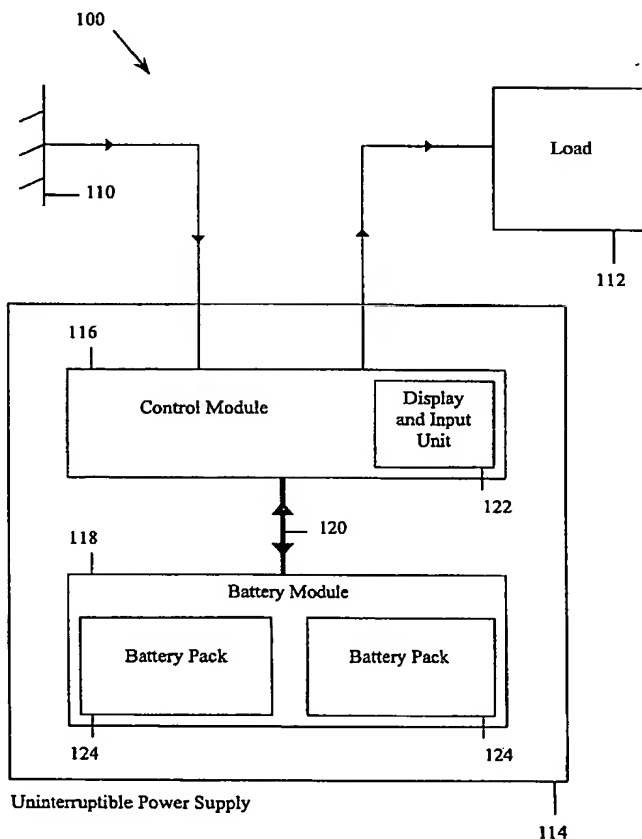
(74) Agents: **KELTIE, David, Arthur et al.**; David Keltie As-
sociates, Fleet Place House, 2 Fleet Place, London EC4M
7ET (GB).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,
SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI,
SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: UNINTERRUPTIBLE POWER SUPPLY APPARATUS AND METHOD



(57) Abstract: An uninterruptible power supply device (114) for supplying electrical energy to one of an array of loads (112) having a broad range of power requirements, the uninterruptible power supply (114) including: at least one power means (118) for providing electrical energy for the said one load (112); and control means (116), connected to the or each power means (118) and the load (112) wherein; the or each power means (118) incorporates a plurality of electrical potential energy storage units (124); and the control means (116) is arranged to connect the electrical potential energy storage units (124) according to the power required by the load (112), the same power means being employable for each one of the array of loads (112).



Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:

1 April 2004

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 03/00839

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H02J9/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H02J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/061822 A (LIEBERT CORP) 23 August 2001 (2001-08-23) page 3, line 2 - page 6, line 17; figures 2,3 page 6, line 29 - page 7, line 4 page 11, line 1 - page 12, line 2 page 24, line 23 - page 25, line 7	1,2, 17-19,30
Y		3,15
X	US 5 332 927 A (PAUL STEVEN ET AL) 26 July 1994 (1994-07-26) column 6, line 62 - column 7, line 17; figure 3 column 10, line 16 - line 29	28
Y		3,15
	----- -/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

25 November 2003

Date of mailing of the international search report

05.02.04

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lorenzo Feijoo, S

INTERNATIONAL SEARCH REPORT

Inter al Application No
PCT/GB 03/00839

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 295 215 B1 (AKBARI EDWARD ET AL) 25 September 2001 (2001-09-25) column 5, line 66 - line 39; figure 3 -----	30
X	WO 01/093403 A (VARENNES CHRISTIAN DE ;DUGUAY LOUIS (CA); GOT PIERRE (CA); ASTEC 1) 6 December 2001 (2001-12-06) abstract; figure 1 page 1, line 12 - line 35 page 5, line 19 - page 7, line 8 -----	1
A	WO 01/073914 A (EDEVOLD CRAIG ;LAYDEN DAVID (US); POWERWARE CORP (US); WINCH CARY) 4 October 2001 (2001-10-04) abstract paragraph [0005] - paragraph [0006] paragraph [0062] -----	
A	GB 1 515 577 A (MASSACHUSETTS INST TECHNOLOGY) 28 June 1978 (1978-06-28) abstract page 1, line 13 - line 39 column 3, line 98 - line 112 -----	
A	DE 42 37 835 A (SIEBERTH WULF DIETRICH DIPL IN ;DURAS JOCHEN DIPL ING (DE)) 5 May 1994 (1994-05-05) the whole document -----	
A	US 5 994 795 A (GABILLET JEAN-PAUL) 30 November 1999 (1999-11-30) column 1, line 44 - line 59; figure 2A -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/00839

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 37
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-19, 21, 28-30

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/GB 03/00839

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-19, 21, 28-30

1.1. claims: 1-14, 21

UPS device comprising power means and control means; the power means incorporates a plurality of electrical energy storage means, each storage unit providing the same electrical potential energy; the control means is arranged to connect the electrical potential storage units according to the power required by the load, the same power means being employable for each one of the array of the loads.

1.2. claims: 28-29; 15-16

Provision of dual mains input for an UPS

1.3. claims: 30; 17-19

Provision of bypass capability for an UPS

2. claims: 31-33; 22-24

Provision of a rotating LCD display unit for an UPS

3. claims: 34-36; 20; 25-27

Provision of multi-format design for an UPS: modular units being configurable into rack-mount or standalone format

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intellectual Property Application No

PCT/GB 03/00839

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0161822	A	23-08-2001	AU 4155901 A EP 1258070 A2 WO 0161822 A2 US 2001033502 A1	27-08-2001 20-11-2002 23-08-2001 25-10-2001
US 5332927	A	26-07-1994	US 5198698 A CA 2103582 A1 EP 0659306 A1 JP 6507539 T WO 9214292 A1	30-03-1993 12-08-1992 28-06-1995 25-08-1994 20-08-1992
US 6295215	B1	25-09-2001	NONE	
WO 0193403	A	06-12-2001	US 6281602 B1 AU 7375301 A WO 0193403 A2	28-08-2001 11-12-2001 06-12-2001
WO 0173914	A	04-10-2001	US 6310783 B1 AU 4959301 A EP 1269205 A2 WO 0173914 A2 US 2002136042 A1	30-10-2001 08-10-2001 02-01-2003 04-10-2001 26-09-2002
GB 1515577	A	28-06-1978	US 3909685 A CA 1022617 A1	30-09-1975 13-12-1977
DE 4237835	A	05-05-1994	DE 4237835 A1	05-05-1994
US 5994795	A	30-11-1999	FR 2762456 A1 CA 2233410 A1 DE 69809833 D1 DE 69809833 T2 EP 0874440 A1 ES 2186978 T3 JP 10309043 A	23-10-1998 21-10-1998 16-01-2003 14-08-2003 28-10-1998 16-05-2003 17-11-1998